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ABSTRACT

The first of three papers in this publication describes the Harrison School District Bilingual Demonstration Project, a modified curriculum and instructional program which builds on the children's experiences and extends their culture and their view of it in a bilingual, multicultural school environment available to both English speaking and limited English proficient children. The program's instructional approach, components (curriculum, language arts, methodology, parent and community involvement, values, management), staff, institutional support, evaluation, and replication are discussed. The second paper presents a strategy for identifying and resolving problems through an analysis of the forces which contribute or hinder problem-solving or decision-making, and lists six steps to be taken in order to progress to the discovery of possible solutions that can lead toward movement in the desired direction. The last paper discusses the cognitive learning theories of Bruner, Gagne, and Piaget and their implications for bilingual education. Topics discussed include cognitive position and transfer; perspectives on transfer; Gagne's cumulative model for the transfer of learning; Piaget's development states (sensorimotor, preoperational, operational); and Bruner's models of representation, learning, and cognition. A chart depicting the high points of each of the theoreticians and how they correlate in bilingual education is provided. (NQA)

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THE HARRISON SCHOOL DISTRICT DEMONSTRATION PROJECT: A MODEL FOR A PLURALISTIC MULTICULTURAL SOCIETY WITHIN A PUBLIC SCHOOL SYSTEM

Jim Bransford
Martha Romero
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INTRODUCTION

To single out any child or group of children for special services has traditionally been a way of isolating (consciously or inadvertently) a population within the school environment. This has been true of language related programs such as English as a second language and bilingual education. Current research indicates that children progress more rapidly in their intellectual development in an integrated environment which reflects their home culture and in which their home language is used. Incorporating the children's culture and language into the classroom can minimize the shock of a totally new environment and facilitates learning.

Research also reveals that children need an introduction to school via an educational program which is predominantly experience-oriented. This guided experience is developmentally linked to oral language and ultimately to reading and writing (McCarthy, 1954 and Modiano, 1962).

These findings present a significant challenge to educators in general and to educators in bilingual programs in particular. How can a school meet the individual needs of limited English proficiency (LEP) children and at the same time integrate these children into the total school community? A less often expressed but salient challenge is the recognition of the fact that American society is by its very nature a pluralistic, multicultural society and that our schools have traditionally neglected to educate all children to function in such a society.

The goal of our educational system should be to build on the children's experiences and their description of those experiences, and to extend the children's culture and their view of it by means of a modified curriculum

and instructional program which builds on what the children know, creating thereby a school environment which is multicultural and available to both LEP and non-LEP children.

THE HARRISON SCHOOL DISTRICT BILINGUAL DEMONSTRATION PROJECT

The Harrison School District No. 2 in Colorado Springs, Colorado, has implemented a bilingual program which reflects the above-mentioned goal. The district, with an enviable record of providing quality education through highly successful bilingual programs, has recently been funded as a Title VII demonstration project. It provides for the full participation of English speaking and LEP children in a bilingual, multicultural setting. In this environment the district proposes to impart an understanding of our pluralistic society to both groups of children and to enable them to become fluent in English and Spanish. Bilingualism is a common phenomenon among educated people in most countries.

Sixty percent (60%) of the student population in the bilingual program at Centennial School, the site of the program, has limited English proficiency. The other forty percent (40%) are students whose home language is English. Thus, the project will mainstream the bilingual multicultural curriculum.

The goals of the project are:

1: to improve inter-ethnic relations within the community and the school;

2: to model the concept of a multicultural society within the school environment and to show how the various cultures positively influence each other;

3; to improve the bilingual program outcomes by including the whole community and all the school; and

4: to develop a broad political support base which will have influence on the power structure by involving a cross section of the community.

To implement these goals, the project will seek to provide opportunities for interaction among students, teachers, and parents. Centennial School already provides vehicles for community, teacher, and student interaction, such as leisure time fairs and multicultural festivals. Additionally, parents are involved at all levels and components of the program. These include one-to-one tutoring and parent training workshops whose objective is to

give parents the training needed in order to assist in all aspects of the program, from the administration of standardized tests to the teaching of folk art skills.

The program further proposes to utilize a cross-age and cross-cultural peer tutoring component to improve the academic achievement of all students. Cross-age interaction is based on research which indicates that the peer group provides significant modeling for language development and behavior. (Weinrich, 1966 and Chomsky, 1967).

The program affords opportunities for children to increase knowledge and develop awareness of various cultures by incorporating activities in the classroom which have as their outcome cultural awareness, human relations skills, and respect for others. Colorado Springs is the site of several military installations and of major corporations. Consequently it has a highly mobile population. The children of military personnel stationed at Peterson Air Force Base and Fort Carson Army Base attend school at Centennial. They and the children from federally funded low income housing located in the surrounding area give the Harrison School District a multi-ethnic atmosphere.

In order to help staff personnel on the project internalize the principles of bilingual/multicultural education in the areas of cultural awareness and the nature and role of language, the project will provide teacher training in multicultural curriculum development. Parental and community involvement in this in-service training will be encouraged.

Significant effort will be made to integrate school activities with the home environment and the community. In this way the children can experience the pluralistic character of our society in a comprehensive manner.

INSTRUCTIONAL APPROACH

While the learners' self-concept is considered in all project activities and emphasis is placed on the development of positive attitudes and personal involvement, the instructional design follows a carefully conceptualized plan to enhance academic achievement. A dual language approach is used in the presentation of all content materials in a well-planned bilingual, multicultural setting.

Implemented in K-2 at Centennial Elementary School during the first year, the program is expected to expand at the rate of two grade levels per year. The ultimate goal in terms of expansion is to provide a K-6 bilingual, multicultural demonstration project which incorporates the full participation of children whose home language is English.

The carefully planned curriculum and instructional program include small group and individualized instruction, team-teaching, cross-cultural teacher exchange, cross-age helpers to assist in language development, parental involvement in the classroom, the use of learning and interest centers, and the development of multi-media materials to extend the children's experience base (Jaramillo, 1972).

The components of the program are organized in such a way as to highlight each major element in the design as shown on the chart on page 5.

STAFFING AND INSTITUTIONAL SUPPORT

It is essential that a program of this type have a school administrator who is highly committed to the success of all children and who is especially supportive of the rationale and principles of the project. This is the case at the Harrison School District. The staff recruited for the program at Centennial Elementary School have been selected with the following criteria in mind.

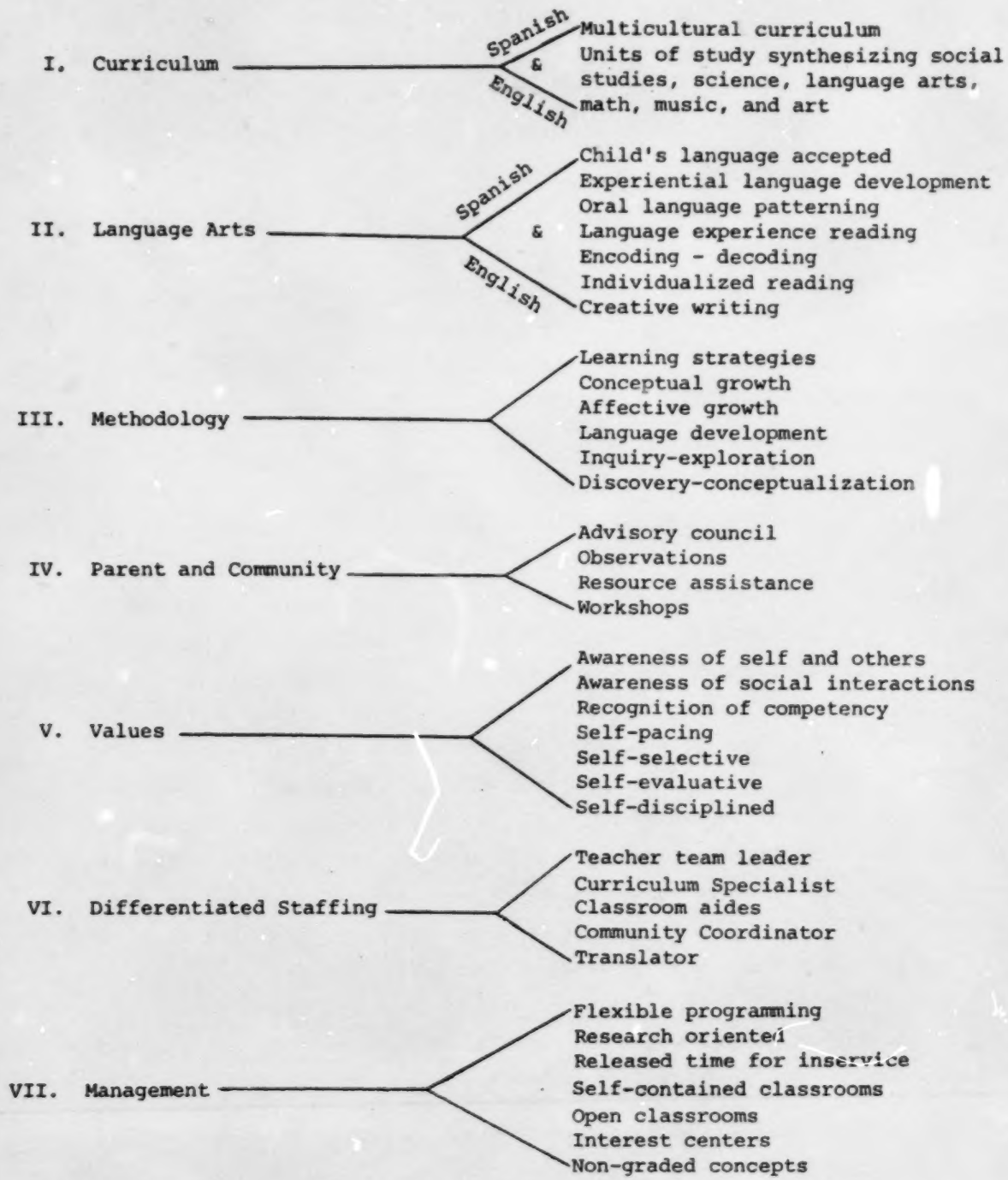
a. Language fluency, literacy, and the ability to teach in both Spanish and English,
b. Awareness and acceptance of students' culture,
c. Training in the philosophy and methodology of bilingual education,
d. State certification,
e. Desire to participate in the program, and
f. Willingness to be involved in an extensive staff development program.

An integral part of the program is a team-teaching approach which utilizes music, art, and core curriculum teachers.

The following priorities for staff development were identified by a needs assessment that was previously conducted:

a. Methods of teaching bilingually,
b. Use of the bilingual aide,

COMPONENTS OF THE HARRISON BILINGUAL MULTICULTURAL PROGRAM



c. Oral language development in the classroom,

d. Developing a multicultural curriculum, and

e. Methods of teaching Spanish as a second language.

The Harrison School District is fortunate to have access to the resources of the University of Northern Colorado, the University of Southern Colorado, the University of Colorado (Cragmor Campus), and BUENO Bilingual Education Service Center and the Center for Bilingual/Multicultural Education Research and Service at the University of Colorado at Boulder.

EVALUATION AND REPLICATION

The project at Centennial School has contracted the Center for Bilingual/Multicultural Education Research and Service to provide a comprehensive evaluation and to assist in the replication of the program. The instruments selected for evaluation are: the Language Assessment Scale (LAS), the Self-Observation Scale (SOS), the Metropolitan Achievement Tests, and criterion referenced checklists.

The Language Assessment Scale will be used as a pre- and post-test of oral linguistic proficiency. It will be administered in English to the students at Centennial and to the students at Pikes Peak Elementary School, the control group school in the district. The LAS (Spanish version) will be administered as a pre- and post-test to the English speaking children to measure growth in a second language. It will be administered to the Spanish speaking children to measure growth in the native language.

The SOS will be used to measure the children's perception of themselves in relation to their peers, teachers, and the school. Criterion referenced checklists, as well as the Metropolitan Achievement Tests will be used to compare the growth of participants in the project with national standardized norms in academic skills. The Center will also develop a series of instruments to measure community impact of the project and will be involved in substantive interviewing and observation data collection to obtain information not usually collected by evaluation teams.

Internal evaluation of the project will monitor the degree to which project objectives are met while the external evaluation team will analyze the data relevant to the successful replication of the project.

In future issues of the Monograph Series, the Center will make avail-

able new materials in evaluation and curriculum design developed by this project.

Questions pertaining to the implementation of the project should be directed to Ricardo Concha, 1660 S. Chelton, Colorado Springs, Colorado 80910. The telephone number where Mr. Concha can be reached is (303) 597-1497. Questions pertaining to the activity of the external evaluation team should be directed to Jim Bransford, Center for Bilingual/Multicultural Education Research and Service, Education Building, Campus Box 249, University of Colorado, Boulder, Colorado 80309.

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THE UTILIZATION OF A MODIFIED FORCE FIELD ANALYSIS STRATEGY TO ASSIST PARENTS IN PROBLEM SOLVING AND DECISION MAKING

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One of the many areas of emphasis supported by the Department of Education through the Office of Bilingual Education and Minority Language Affairs (OBEMLA) is the active involvement of parents in the education of their children. Title VII funded programs, at the local, college/university, and non-profit organization levels, have concentrated much energy in determining ways by which parents can be trained and be actively involved in bilingual education programs.

To a great extent, training has focused on parental involvement in the bilingual classroom, the rights and responsibilities of parents, teaching methods which parents can utilize at home in support of classroom activities, concept development, and on the understanding of parental roles as members of bilingual advisory councils and related committees. Although training has been specific, valuable, and essential to parents as they assume a stronger role in the education of their children, it has been severely limited. Because it is specific, there is little transfer of the knowledge gained in a particular situation to problem areas in new and different situations, in spite of the fact that parents feel comfortable and judge themselves to be effective in addressing certain problem areas.

One of the ways in which parents can be more effectively aided in addressing the host of problems facing them as they become more involved in school and community issues related to education is to provide them with efficient general problem-solving tools and strategies.

Because handbooks of practical strategies for teachers and students abound, classroom teachers confronted with problem situations can turn to a number of resources, human and material, that provide ideas and hints for effective resolution of pertinent problems. Students also have access to a number of resources that suggest approaches and methods they may use

to achieve sought after goals. Parents have not been as fortunate. In most cases, parents are advised of the problems they are facing or will face either as involved parents or as members of advisory groups and are given solutions to those problems. There is little opportunity provided for parents to identify problems and less opportunity for them to independently seek solutions.

While there is no sure-fire method for the constructive resolution of all problems, there are general tools parents can use which will at least allow them to identify problems and which permit them to approach their resolution in a more or less systematic manner.

One of these methods is a take-off on Kurt Lewin's Force Field Analysis Model for Problem Solving. Lewin, a former director of the Research Center for Group Dynamics at the Massachusetts Institute of Technology, was a prolific writer basically concerned with group dynamics and the relationship of groups with individuals. Much of this work focuses on what can be considered value classification, group and inter-group conflict, conflict management, and strategies for the effective resolution of conflict and related problems and decisions.

In force field analysis, Lewin introduces simple, easily understood tools which could be used by individuals or groups to identify and resolve problems through an analysis of the forces which contribute or hinder problem-solving or decision-making.

What Lewin suggests as a problem solving tool is in effect only a conscious recognition of a decision-making or problem-solving strategy that most people already use to address many of the daily problems and concerns. The strategy calls for the identification of forces or factors that both support and hinder forward movement in problem-solving or decision-making. Lewin feels that once both the supporting and opposing forces impacting decision-making or problem-solving are identified, selecting an appropriate decision relative to a particular situation is more or less reached through the process of elimination. The forces remaining after cancellation and elimination of other forces, to a great extent determine the direction of a particular decision and/or provide the basis for the resolution of the problem.

When utilizing force field analysis, it is assumed that the problem to be addressed or the decision to be reached has already been identified. Lewin does not stress this issue in his explanation of force field analysis. He does, however, indirectly refer to the importance of correctly identifying the problem and the dangers of focusing on symptoms rather than on the actual problem. Lewin more directly addresses the issue of "background" when referring to problem identification. The background of the individuals or groups of individuals is a critical factor to be considered not only in the identification of the problem, but also in the search for solutions to the problems or in decision-making in general. How an individual perceives a problem and the solution to that problem is determined to a great extent by his background. One of the most important components in that background is the social group or groups to which the individual belongs.

During most of an individual's life, he acts not only as an individual but also as a member of a social group, be it the immediate family, his extended family, economic class, political party, civic organization, ethnic group, or religious affiliation. These groups may overlap but they are all not equally important at any given time. In a particular situation an individual may feel and act as a member of a particular group even though he belongs to several.

The social group with which an individual relates in a given situation to a great extent will determine his perception of the problem and its resolution.

Generally, in every situation, the individual seems to know what group he belongs to. He knows where he stands; this understanding largely determines individual or group behavior and/or action.

In the attempt to identify and/or resolve conflicts or to make decisions, problems arise when an individual is not cognizant of the social group to which he belongs. This uncertainty of "background" leads to uncertainty in action or behavior which in turn leads to being self-conscious, inhibited, and perhaps to being inclined to overact or to act inappropriately.

The importance, then, of the individual's understanding his position or background in relation to a problem cannot be overemphasized. The identification of the problem and the understanding of the individual or

group position relative to that problem precedes the actual application of any problem-solving strategy.

Another important factor that must be considered prior to the application of a remedy or strategy to a particular problem is the danger and risk associated with the problem and any solution. In effect, the analysis of the forces opposing decision-making or problem-solving will identify the risk and danger involved. However, it is important that in the process of examining these forces and considering decisions individuals or groups of individuals clearly separate, identify, and recognize the risks or dangers associated with particular situations. Questions that need to be considered include: Is this whole issue important? Are there related issues that are more important? What long-term and short-term gains can one expect to achieve? What is the most one can expect from accurately addressing this matter? What does one stand to lose? Can one afford to do nothing?

Once these answers have been adequately and satisfactorily addressed, the individual or group of individuals can proceed to identify those forces that are supportive of a decision or problem-solving situation as well as those forces that oppose or hinder a decision or the resolution of the problem. Identification of these forces and the analysis of their importance relative to the proposed decision and/or the problem at hand is known as force field analysis.

Force field analysis can be defined as a two-state process. First, it is a systematic attempt to reveal or identify forces working for and against the attainment of a particular goal, the resolution of a problem, or the making of a decision. Second, through this bared structure, it is a tool which will help identify possible solutions and will assist individuals or groups to move toward their goal, decision, or problem resolution.

The first stage can be illustrated by the diagram on page 12.

Carefully identification and listing of the forces on each side of the status quo reveal the forces and prepares the way for the second stage, the discovery of possible solutions that can lead toward movement in the desired direction.

Problem:

Desired Direction of Movement ⟶

Driving Forces ⟶		⟵ Restraining Forces
1.	Status Quo (Equilibrium)	1.
2.		2.
3.		3.
4.		4.

The following six steps should be taken in order to progress through the second stage.

1. Identify those forces (driving forces) that will help solve the problems or reach a decision and those that are working against (restraining forces) the resolution of the problem or decision-making
2. Analyze those forces in terms of their relative importance, strength, and resistence to change, perhaps ranking them in terms of their importance.
3. Examine the opposing forces to identify those that may be eliminated.
4. Analyze the remaining forces identifying those driving forces which may be strengthened or changed and those restraining forces that can be eliminated.
5. Evaluate the remaining forces to determine if a point has been reached which could result in a decision or problem resolution, a stalemate situation, or a situation in which the presence of overwhelming opposing forces prohibit further action.
6. Identify the specific action to be taken which includes individual roles, timelines, and specific approaches.

A number of different strategies have been developed for use in general problem-solving and in decision-making. Many of these are similar to force field analysis and many produce the same general results. The value of force field analysis lies in its simplicity, utility, and transferability. This strategy can be applied to most if not all problem situations individuals confront in their daily lives. It could be adopted with great success for use in the training of parents in the bilingual program.

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COGNITIVE CONSIDERATIONS FOR BILINGUAL EDUCATION: APPLICATION OF THE RESEARCH BY BRUNER, GAGNE, AND PIAGET

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University of Washington

INTRODUCTION

In order to understand the relationship between psychological theories of learning and bilingual education, it is necessary to know what is meant by such terms as bilingualism and bilingual education. In addition, it is necessary to understand the premise or assumption of bilingual education.

To begin with, bilingualism has been defined by Amado Padilla (Martínez, 1977) as the encoding and decoding skills in two languages. Padilla further states that it is the ability to communicate in two languages and that it may be regarded as a skill existing along a continuum ranging from monolingualism to completely balanced bilingualism. Furthermore, a balanced bilingual would be a person equally skilled in two languages as contrasted to a receptive bilingual who can understand two languages but can function only in one of them. A monolingual would, by definition, be a speaker and comprehender of only one language.

Title VII of the Elementary and Secondary Education Act of 1978 (P.L. 95-561) defines bilingual education in the following manner:

> The term 'program of bilingual education' means a program of instruction, designed for children of limited English proficiency in elementary or secondary schools, in which, with respect to the years of study in which such program is applicable--
>
> (1) there is instruction given in, and study of, English and, to the extent necessary to allow a child to achieve competence in the English language, the native language of the children of limited English proficiency, and such instruction is given with appreciation for the cultural heritage of such children, and of other children in American society, and, with respect to elementary and secondary school

> instruction, such instruction shall, to the extent necessary, be in all courses or subjects of study which will allow a child to progress effectively through the educational system. (92 STAT. 2270)

The assumption is made that while children learn content-related skills in their native (first) language, they will develop proficiency in the English (second) language. After a period of time the child is expected to transfer learning acquired in the first language to the second language. Thus the child can be instructed in either the first or second language without appreciable loss in academic achievement. This is the assumption made by bilingual education.

Much of the problem faced by bilingual students in our public schools has been attributed to "incompatibilities" existing between the learner characteristics of the student and the requirements for accomplishment of educational objectives imposed by teachers and traditional curricula (Cárdenas and Cárdenas, 1972). Research by Ramírez and Castañeda (1974) and others suggests that the identified "field sensitive" cognitive style of many learners and its inherent characteristics have implications which need to be considered by educators. They suggest that schools need to change in such a way as to accommodate the learner's strengths and to develop abilities not currently possessed by the student.

> Sociologists usually split the school's functions into two parts: the manifest functions (to teach our children to improve their character, to serve as a social hub) and the latent functions (to introduce youth to competition, to keep youth out of the labor market, to select the meritorious and to weed out the unfit, to serve as a juvenile detention center for those who don't seem to make it very well in society, and by bringing young folk together, to convenience matchmaking). (American Education, April, 1976)

The dilemma of the bilingual student is that the manifest functions of the school were not designed to accommodate individuals from different ethnic and linguistic groups. The student was and is expected to shed the character and language of his particular community and assume the role of

the mainstream student. Secondly, the latent functions of the school pose a barrier to the integration of the bilingual student into the mainstream of school and society. Bilingual education is perceived by Public Law 95-561 (ESEA Title VII--The Bilingual Education Act) and by many educators as an important part of the structure of the bridge to equal educational opportunity. The acceptance of students and their cultures as notable and valuable is a more difficult but attainable goal. In reference to the manifest functions of the school and the bilingual bridge, one may ask what is the nature or structure of the bridge? In educational terms, it is the transfer of learning.

PERSPECTIVES ON TRANSFER

There is a psychological issue that revolves around the notion of transfer of learning or training. The issue stems primarily from the different attributes assigned to the transfer of learning or training. Since the early part of the nineteenth century, the concept of transfer of learning has occupied a rather prominent role in research.

Formal discipline, the process of exercising the mind by learning difficult subjects, was once considered the best vehicle for general transfer. In what are considered classical studies, Thorndike and Woodworth (1901) found little correlation between the difficulty of school subjects and mental abilities in a sample of over 13,000 children.

Judd (1908) developed a generalization theory of transfer. In his experiments, Judd took fifth and sixth grade boys, matched paired and split them into experimental and control groups. He explained the principle of refraction to the experimental group while the control group received no explanation and was left to discover the nature of refraction by experience. Both groups were allowed to throw darts at a target that was submerged in twelve inches of water. There was no appreciable difference between control and experimental groups with regard to success. However, when the depth of the water was altered to four inches, the control group's performance fell markedly. The experimental group made the proper adjustments and were significantly more successful.

Thorndike (1914), on the other hand, utilizing his earlier experiences in studies with Woodworth, formulated a theory which accounted for some of

Judd's observations. Thorndike considered transfer to take place most effectively when "identical elements" were involved. Thorndike's experiment called for training subjects to a high degree in estimating areas of rectangles, lengths of lines, weight of objects, and marking parts of written speech. The findings of the study gave indications that training had a positive effect and that transfer was greater when the tasks were similar.

The studies mentioned provide an historical perspective, but are only a sample of the number of experiements have been done in this area. Orata (1935) reviewed some 167 experiments on transfer. Of these, he concluded that only 76 percent were successful. Although the studies are too varied to be described in detail, Trow (1958) concluded:

> In the hundreds of researches that have been conducted in transfer of learning, three definite conclusions recur again and again. The first is that intelligence is positively correlated with transfer. The second conclusion is that in general the more similar the tasks, the greater the transfer. The third clear conclusion from the experiments is that methods of learning and instruction are of prime importance (p. 69).

Transfer, however, is not as clear-cut as it may appear to be. It varies with variations in leaning theory. As Shulman (1968) indicated, available literature had not resolved the issue of transfer of learning, especially as it applies to any psychology of learning.

A prime issue in the tansfer controversy is the question of how the different proponents of learning define transfer. It is not easy to discuss transfer in relation to competing theories of learning when in fact the operational definitions given for transfer are not compatible. Since the definitions of learning are different, a comparison of learning theories is difficult to make. As difficult as such a comparison may be, it should be remembered that transfer is one of the central concepts of all psychological theories of learning. This comparative issue becomes even more significant when learning theorists cannot agree on basic educational issues. For example, Shulman (1968) briefly examined the positions of Gagne and Bruner in terms of instructional objectives, instructional styles, readiness,

and transfer. He points to their differences as follows:

> The positions of Bruner and Gagne take very different points of view with respect to the objectives of education. This is one of the major reasons why most attempts at evaluating the relative effectiveness of these two approaches have come to naught. They really cannot agree on the same set of objectives. Any attempt to ask which is better --Michigan State's football team or the Chicago White Sox-- will never succeed. The criteria for success are different, and it would be absurd to have them both on the same field competing against each other.
>
> ...let it be noted that when two conflicting approaches seek such contrasting objectives, the conduct of comparative educational studies becomes extremely difficult. (pp.35,37)

To resolve which psychological theory of learning best accounts for the phenomenon of transfer could be a monumental task and well beyond the scope and intent of this paper. The issue is recognized, however, in order to show the need for any discussion on transfer to make clear the psychological theory which underlies it. In the case of this paper, the underlying theory of learning is the cognitive theory which will be briefly defined in the following section. Included in this discussion are references to the works of Gagne, Bruner, and Piaget.

THE COGNITIVE POSITION AND TRANSFER

As indicated earlier, the various ways psychologists observe and categorize human behavior is not consistent among psychologists. For instance, Spodek (1973) offers the following contrasting models of how the world is viewed by behaviorist and phenomenologist:

Behavioral Model	Phenomenological Model
1. Humans are predictable.	1. Humans are unpredictable.
2. Humans can be meaningfully described in terms of their behavior.	2. Humans can be described in terms of their consciousness.
3. Humans are information transmitters.	3. Humans are information generators.

4. Humans live in an objective world.	4. Humans live in a subjective world.
5. Humans are rational beings.	5. Humans are arational beings.
6. All humans are alike.	6. Each human is unique.
7. Humans can be meaningfully described in absolute terms.	7. Humans can be meaningfully described in relative terms.
8. Human characteristics can be investigated independently of one another.	8. Each human must be studied as a whole and not as independent characteristics.
9. Man is reality.	9. Man is potentiality.
10. Humans are knowable in scientific terms.	10. Humans are more than we can know about them.

In order to define the cognitive position, let us look at how Ausubel (1966) differentiated it from the neo-behaviorist position. According to Ausubel, the neo-behaviorists are concerned with observable learned behaviors such as those which manifest themselves in stimulus-response and in environmental conditions which influence those behaviors. The neo-behaviorists are reluctant to address the notion of consciousness which cannot be reliably observed. They believe that only by observing categorizable behaviors can general scientific statements be made regarding behavior. The cognitive psychologists, on the other hand, according to Ausubel, assume quite the opposite and feel that by examination of the different states of consciousness more appropriate statements regarding human functioning and underlying cognitive process can be made.

Ausubel classified Bruner, Gagne and himself as cognitive psychologists. However, Ausubel stated that both Bruner's and Gagne's positions on transfer differ from his as follows:

> This difference stems in part from their somewhat more behavioristic conception of the nature of knowledge as consisting of the capability of performing different classes of problem-solving tasks. Thus, in fostering transfer, Gagne focuses on the learner's possession of the component or subordinate problem-solving capabilities required for manifesting a given higher-order problem-solving capability. Concentrating more on the deductive aspects of transfer, Bruner emphasizes "generic learning" because it can

> facilitate derivative problem-solving, that is, the solution of problems that are particular exemplars of a more general proposition. Ausubel, on the other hand, views knowledge as a substantive (ideational) phenomenon rather than as a problem-solving capability, and regards transfer functions of cognitive structure as applying more significantly to reception learning than to problem-solving in the typical classroom situation. (p. 10)

Thus, even within a particular psychology of learning such as that of the cognitive psychologist, there are many different interpretations of the significance and methods of transfer.

The works of Gagne, Bruner, and Piaget have acquired prominence in the field of education in general and is a particular interest in the area of bilingual education. The basic tenets of their work are discussed in the following sections.

GAGNE'S CUMULATIVE MODEL FOR THE TRANSFER OF LEARNING

Gagne (1952) developed the cumulative model for transfer of learning. Robert M. Gagne, a one-time military psychologist, developed a rather straightforward analytic theory of learning and transfer based on task analysis from the simple to the complex. His definition of learning states that learning is a change in human disposition that can be retained and is not merely ascribable to the process of growth (Gagne, 1965). For him, the major learning influences are derived from both genetic and environmental circumstances. More specifically, Gagne states that growth may be genetic, but learning is definitely influenced by the environment. He believes that there is substantial evidence that intellectual skills are learned most efficiently whenever the hierarchical sequencing of subordinate skills is first established. Each learner approaches new learning situations with some previously learned prerequisite skills.

> Gagne's work on the elementary curriculum project entitled Science--A Process Approach (1968) reflects his cumulative model for transfer of learning. Gagne's operational definition of transfer states that:
>
> cumulative learning thus assumes a built-in capacity for

> transfer. Transfer occurs because of the occurrence of specific identical (or highly similar) elements within developmental sequences. Of course, "elements" here means rules, concepts, or any of other learned capabilities.

In addition, Gagne (1962) clarified the hierachical scheme of subordinate and superordinate skills in his hypothesis:

> (a) no individual could perform the final task without having these subordinate capabilities (i.e., without being able to perform the simpler and more general tasks), and (b) that any superordinate task in the hierarchy could be performed by an individual provided suitable instructions were given, and provided the relevent subordinate knowledge could be recalled by him. (p.356)

The model is a hierarchical scheme for transfer and resembles some earlier studies of Maltzman (1955) and Harlow (1949). The model is constructed of several sequences of subordinate and superordinate skills, the two essential elements of the model, that are the results of task analysis.

Gagne, in his work on programmed learning, based some of the important aspects of his theory on task analysis and cumulative learning as a model for specific transfer on his research findings (Gagne and Brown, 1961). In this model of learning one must (a) identify the learner's current performance capabilities, (b) specify in hierarchical fashion each of the performance capabilities to be acquired (instructional objectives), and (c) plan, select and present instructional sequences. Gagne further states that any human task may be analyzed into a set of component tasks quite distinct from each other in terms of the operations needed to produce them. These task components are mediators of the final task performance. Thus, the basic principles of training design need to identify component tasks, to insure task completion, and to arrange learning situations in a sequence. The task analysis mode is inductive in that instruction goes from the simple to the complex. This process is similar to neo-behaviorist work which defines training in operational terms and accounts for transfer by indicating

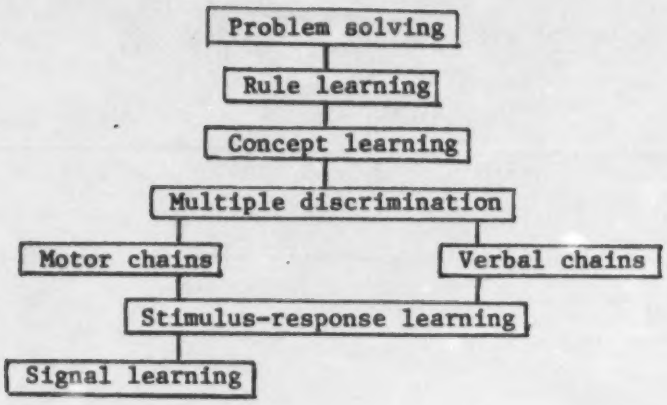
where specific stimulus is similar to new learning tasks.

The provision for the presentation of challenging opportunities for thinking is very important. Gagne (1962) states that positive transfer depends on "(a) the recall of relevant subordinate learning sets, and upon (b) the effects of instruction" (p. 358). Gagne further states that there are two important related variables for which one must account in a transfer model such as the one he postulated, knowledge and instruction. Knowledge is defined as the capabilities that an individual possesses at any stage. Instruction consisted of the following components: (a) recognizing and acknowledging the required final task, (b) identifying the elements of the task, (c) receiving practice and repetition to insure recall, and (d) being guided by one's thinking. In the application of his theory, Gagne (1962) was quite successful with experimental groups. He interpreted the results as positive evidence of the knowledge hierarchy. One of the overall conclusions was that if a subject passed a higher-level task, no lower task had been failed. Gagne also stressed that individual differences may have accounted for less than 100 percent success in his work and that a model of transfer such as the one he conceived needed to take into consideration these individual differences as an important variable.

HIERARCHICAL LEARNING MODEL (GAGNE, 1965, 1970)

Gagne's model accounts for two basic forms of learning: (a) signal learning (respondent) and (b) stimulus-response learning (operant). The theory of the model is that learning is cumulative and explains that the transfer effects of learning bring internal reference points to facilitate more learning activities. The model depicts intellectual skills as developing from simple to complex in order to enhance cumulative learning as the diagram on page 24 shows.

The model shows a general notion of cumulative learning. The subordinate capabilities (skills) must be acquired before more complex ones are developed. This cumulative learning proposes, for example, that children who may not be able to match liquid volumes (conservation), do not necessarily lack logical processes such as conservation, seriation or reversibility, but may lack concrete knowledge of containers, areas, heights, volumes, depths, widths, liquids, etc. The model assumes that combinations



A Hierarchical Learning Sequence

of simpler principles form more complex ones. Gagne states that stages of development are not related to age as Piaget does, nor to logical structures as in Bruner's theory. Stages of development, he believes, are based on cumulative effects.

Gagne (1970) further suggests that in instruction, a series of questions be answered: (a) For student learning to be most effective, how should the learning task be presented? (b) When the student undertakes a task (learning), what kinds of activities on his part should be required or encouraged? (c) What provisions must be made to insure that what is learned is remembered and is usable for further learning and problem-solving?

Gagne states that we are shifting from a connectionist view of learning to an information processing model to explain how stimuli and responses are connected/processed. However, his model raises questions such as whether learning requires repetition. Studies by Rock (1957), Estes (1960), Gagne, Major, Garstens and Paradise (1962), Gibson (1964), and Reynold and Glaser (1964) have failed to find evidence to support the notion that repetition increases learning. The "information processing" theory of Atkinson and Shiffrin (1968) states that information is first registered in the senses, then coded and later retrieved. In a coding and remembering study, Howard Clark (1969) showed that deliberate coding increased recall by seven times. Gagne reconciles this with the fundamental point that each learner approaches each new learning task with a different collection of previously learned prerequisite skills. One has to start with what the child knows already

and build new skills from there.

Gagne states that there is substantial evidence that intellectual skills are learned most efficiently in a manner which involves the sequencing of subordinate skills. This implies that the kind of control most necessary for acquiring competent intellectual skills is control of the sequence of capabilities which the individual learns.

In an associated work, Gagne and Smith (1962) pointed to the importance not only of knowing what are the expected terminal behaviors in a problem-solving situation, but also of having the ability to formulate the terminal task and subordinate elements in the subject's own words. Gagne felt that the act of verbalization causes reflective and creative thinking. If this conclusion is accepted, then it would seem that the student who has a language preference other than that of the teacher and classmates would certainly be at a disadvantage unless the student is given the opportunity of utilizing the preferred language. On the other hand, if a student is proficient in one language and has only limited proficiency in a second, there may be a tendency to use only the language in which the student is proficient; thus, not developing the second language which is the objective. Limited English proficient children must be challenged to develop their English language skills along with their first language.

For the bilingual situation, Gagne's work is subject to many interpretations. The theory builds a good case for the student who is bilingual and who might prefer to speak in one of two languages. In a bilingual school environment, the student would have several opportunities to express his preferred learning style.

While there is no conclusive evidence supporting Gagne's transfer of learning model as being better than other models, his approach (model) is successful in producing the pre-selected effects (Shulman, 1968). One must keep in mind Gagne's concern for individual differences, which is best stated by Shulman (1968):

> Individual differences in learning styles are major determinants of the kinds of approaches that work best with different children. Yet this is something we have in general not taken into consideration at all in planning curricula--and for very

good reasons. As yet, we do not have any really valid ways of measuring these styles. Once we do, we will have a powerful diagnostic tool. Subject matter, objectives, characteristics of children, and characteristics of the teacher are all involved in this educational decision. (p. 90)

FURTHER IMPLICATIONS OF GAGNE'S THEORY FOR BILINGUAL EDUCATION

One might well ask at this point, what are the relationships among Gagne's learning theory, transfer of learning, and bilingual education? These involve two major foci of schooling: learning, its nature, proper presentation, and verbalization; and curriculum, its proper focus, and the role of language and culture training.

LEARNING

(1) Genetic and Environmental

With regard to major learning influences, one must remember that Gagne believes that an individual is influenced in his development by both genetic and environmental factors. Learning is definitely influenced by the environment. This is an important position for bilingual education in that it supports the notion of adjusting the educational environment to meet educational objectives. It also implies that individuals have great capacity for learning that depends on the learning environment and not on their genetic endowment. It would follow that by adjusting the educational environment one can produce an observable, quantitative change in behavior in the individual.

(2) Hierarchy

a. Hierarchy. If this line of thought is followed, then, to produce this quantitative change in behavior, a learning sequence should be developed. It would be structured so as to elicit overt behaviors indicating that the individual has at least grasped the minimal knowledge to progress onto a higher-level sequence. This indicative approach for a cumulation of knowledge would then manifest itself in problem-solving. Again, the implication here for bilingual education is that incremental, highly structured learning would insure the attainment of educational objectives.

b. Retention, Repetition and Practice. To insure that knowledge was being retained and was not just a momentary phenomenon, the instructional sequencing would include repetition and practice, not in the traditional sense but in the sense of providing different contextual situations, time and again, that would require the application of previously acquired knowledge or application of a previously acquired skill to the task at hand.

(3) Verbalizing

Further, it could be stated that Gagne believed that the chances of attaining the final task would be improved if an individual verbalized it. That is, by knowing what is expected of him and being able to verbalize it, the learner would have a greater chance of accomplishing his task. For the bilingual situation this would mean that verbalization facilitates learning and influences behavior.

a. Task Analysis. This pedagogical strategy would require a process-oriented approach. The educational objective would be stated and, through a process of task analysis, the objective would be broken up into its component parts by sequencing the simple parts of a complex task.

b. Inductive. The instructional format would be an inductive approach, with guided instruction that would require step-wise learning. This external organization would be necessary for optimizing learning.

CURRICULUM

(1) Process Skills--Knowledge Acquisition/Concept Acquisition

The curricular implications for bilingual edcuation are evident. The emphasis would be on the process skills for acquiring knowledge. Such generic skills as communicating, observing, inferring, measuring, understanding space-time relationships, predicting, classifying, and using numbers can be used in many different content-oriented situations such as reading, math, science, and social studies. The generalizable skills learned in one

language could be transferred to higher level skills in another language for the bilingual child. Thus, lessons would not have to be taught twice nor translated, two controversial issues in bilingual classrooms. The evaluation of student progress in this design would be based on the acquisition of skills with concept acquisition being secondary.

(2) Language Training

In this model, there are also considerations for the language of the classroom and the language of the child.

a. Vocabulary. Language training would take place in a restricted sense, the vocabulary needed for task accomplishment. The only other concern would be learning to use the new vocabulary in context.

b. Task Analysis. However, if language is taught as a skill such as communicating, the task analysis model would be applied to language learning. The act of communicating would be analyzed as to its component parts, the number to be dependent on the learner and his current knowledge, and would be taught in an inductive manner.

c. Culture. Similarly, culture would be taught as a task/subject/educational objective, or it would be ignored. The learning environment would be quite structured and programmed to make maximum use of the time that the students were involved in the learning situation.

PIAGET

A giant in the field of developmental psychology, Jean Piaget devoted several decades to the study of children's intellectual growth. According to the Swiss psychologist, human intelligence is highly influenced by genetic transmission and environmental conditions. His extensive research on his own and other children led to the formulation of the following theory as summarized by Edmund Sullivan (in Joyce and Weil, 1972):

> Piaget's description of intellectual development is concerned with the formulation and description of coherent and meaningful stages which reflect the direction and course of mental

development. Intelligence, in the Piaget model, is a process of adaptation and organization. Adaptation is seen as an equilibrium in the interaction of the organism and the environment. Organization involves a structural concept, called the schema. Piaget (1960) defines schemas as essentially repeatable psychological units of intelligent action. Schemas may best be interpreted as types of "programs" or "strategies" that the individual has at his disposal when interacting with the environment...

Adaptation involves the two invariant processes of assimilation and accommodation. Assimilation is the incorporation of the environment into present patterns of behavior. Accommodation is the change in the intellectual structures (schemas) which is necessary in order for the person to adjust to demands which the external environment makes on the individual. (pp. 109-122, 181-198, 361-363)

According to Piaget, one cannot force learning upon a child until he is physiologically mature enough to actively learn. This learning is achieved through interaction with one's total environment. Piaget classifies cognitive development in terms of sequential maturational stages which are characteristic of the functioning of the schemas. The developmental stages are hierarchical in nature but different from those of Gagne. The initial stages lay the framework for coninuous intellectual development through assimilation and accommodation. Although the stages may appear quite rigid, individuals vary in their completion of each stage.

The stages are approximated as follows:

The Sensorimotor stage begins at birth and continues to age two. This stage is also referred to as the manipulative stage in which preverbal behaviors not mediated by signs or symbols occupy the child's focus of attention.

The Preoperational stage follows the sensorimotor stage and usually begins at about age two and continues until age seven. This stage has two substages:

a. The substage of preconceptual thought (2-4 years) marks the beginning of conceptual intelligence (Piaget, 1961) and the development

of imagery or "symbolic function." This substage is followed by the second substage;

b. Intuitive thought (4-7 years) which is the mediating stage between that of preconceptual thought and the more advanced concrete operations stage.

The Operational stage usually starts at about age seven and peaks around age sixteen. This stage marks the beginning of rational thought by the individual. It is subdivided into:

a. Concrete operational thought (7-11 years) which has as its starting point some real system of objects and relations that the child perceives in concrete terms.

b. Formal operational thought (11-18 years) which marks the completion of an individual's emancipation beyond the present reliance on direct perception and action and allows him to transcend concrete experiences in order to form theories about things.

There are several major points to remember in attempting to interpret the Piajetian developmental theory. One point is that the structures (schemas) developed by the child serve as the mediating influence between the child and the environment. They also link the processes of assimilation and accommodation. Should an individual not possess the necessary schema to assimilate certain aspects of the environment, those aspects are nonexistent for that particular individual. As intellectual capacities continue to develop, so does the number and complexity of the schema. Any particular problem may be attacked by the use of more than one schema to a given situation.

A second point is that a child assimilates his environment via the process of accommodation, which is the application of a general structure to a given situation. Accommodation contains elements of newness, and leads to differentiation or previous structures and the formation of new ones. Thus, intellectual growth ensues. Intellectual growth is carefully regulated by physiological maturation such that it is the product of an interaction between internal changes and external forces. Such development is dependent on confrontations with the environment. Although social-environmental factors serve as the media for physiological factors, both are crucial for cognitive growth.

Equilibrium is a third point to remember. It is the self-regulating coordination of the physical, social and physiological maturation forces.

In elaborating Piaget's developmental stages, one can state that at the sensorimotor stage (birth to 2 years) the child has no conception of object permanence. He is more concerned with objects as objects. As a result of repeated experiences, the child gradually develops object permanence. At the preoperational, preconceptual thought stage (2-4 years), a chief concern of the child lies in imitation, play activities and preconcepts exhibited in language behavior. At the intuitive thought stage (4-7 years), the child remains prelogical, but decentering begins to occur. The relationship between objects and their verbal symbols (language) and the concept of conservation are the major concepts evolving at this stage. Classification by single attributes of objects also begins at this stage, although the environment is dealt with symbolically instead of through motor activity alone. At about age seven, the child becomes able to recognize constancy of substance in apparent transformations (Grotberg, 1976, pp. 392-401).

At the concrete operational thought substage (7-11 years), the major evolving concept is that of deductive reasoning. At this stage, logical operations emerge which greatly assist the performance of classification by multiple attributes, by seriation, and by the formation of hypotheses, and which lead to associativity principles. Between the ages of seven and eleven, the child becomes more proficient in dealing with relations and quantities, classes, seriation, class inclusion, equivalence, and the concept of reversibility built upon conservation.

The major concepts dealt with during the formal operations stage (11-15 years) include abstract thinking, syllogistic thinking, hypothetical thinking and other types of thinking behaviors. The child transcends the world of concrete experiences and can deal with problems of probability, permutations, proportions and combinations (Grotberg, 1976).

Does Piaget's theory lend itself to practical, everyday schooling experiences? Can it or should it be applied to bilingual education? Piaget himself has never stipulated that his developmental theories on child cognition would be directly transferable to the classroom situation. Those who would apply his learning theories in such an environment would

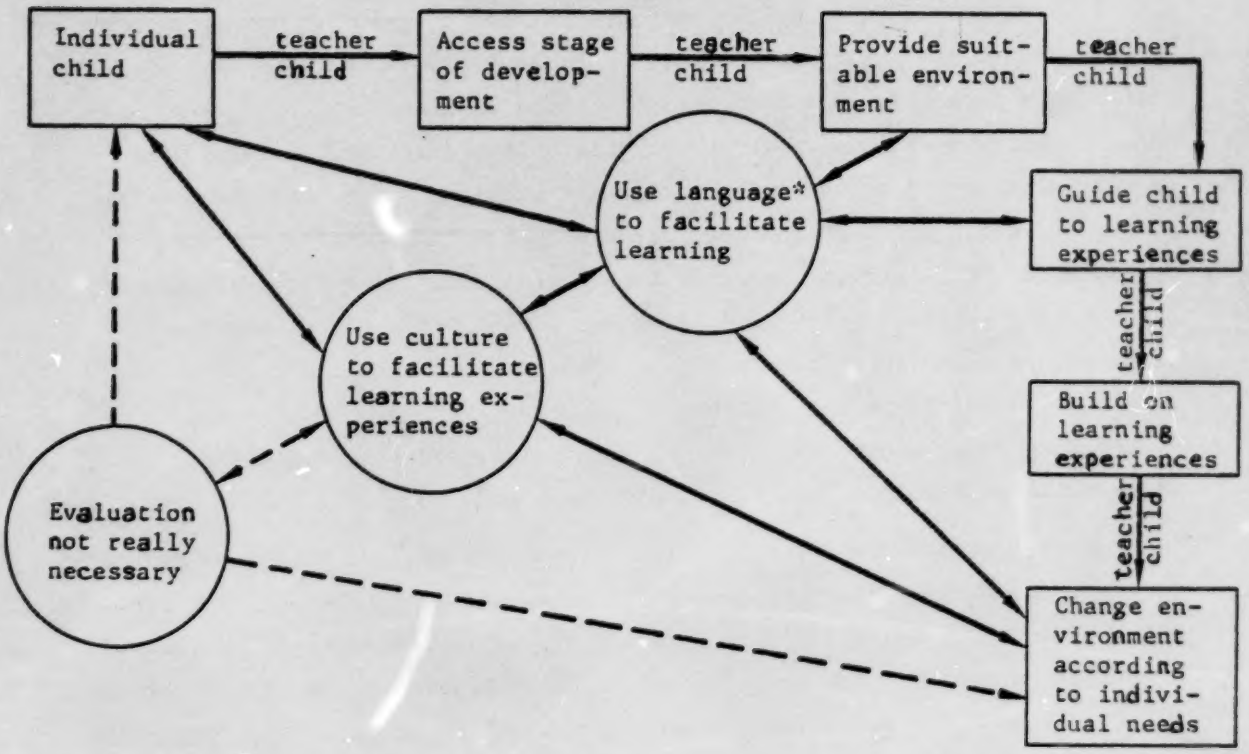
prefer first the availability of a rich objective world matched to the child's developmental stage, where exploration and manipulation lead to discovery learning. Secondly, they would also insist on free peer interaction in classroom activities. The teaching strategy under Piagetian theory takes into serious consideration the roles of the teacher, subject matter, and the nature of the learner. It is made up of a confrontative part where the students come to grips with the illogic of their thinking, thus causing a shift from egocentric to sociocentric thought leading to disequilibrium. In order to reconcile the discrepancies, the child must develop new processes or schemes which will enable him to adapt to the new situation and reach equilibrium. The teacher would be able to see a qualitative change in the student's thinking as interaction, manipulation and transformation processes take place.

Does the use of a learner's native language facilitate the learning process and avoid the postponement of cognitive and psychomotor development? Piaget states that language is not really necessary for learning to take place. He views the use of language only as an expression of what has already been learned. The Swiss researcher would probably agree that bilingualism is a desirable end in and of itself. The teaching of language would be deductive, from the global to the particular, and would include the use of logical operations, integrating culture into the classroom experience as a stimulating and motivating force in conjunction with the environment. A possible Piagetian bilingual model of education incorporating the ideas set forth so far could be expressed like the scheme on page 33.

For a child in a bilingual program utilizing the Piagetian developmental approach, one could utilize both English and Spanish to develop concept formation, seriation, and numbering in order to teach the concept of conservation.

BRUNER

Jerome S. Bruner, a renowned Harvard University educator and researcher on cognition, has been highly influential in the development of teaching strategies and methodologies regarding children's learning patterns. He has conducted extensive research on the course of cognitive growth. Although he has been influenced in his studies on children's growth stages



*English or Spanish or combination (Rodríquez Model, 1980)

Piagetian Model for Bilingual/Bicultural Education

by earlier philosopher/educators such as Socrates and Piaget, he has nevertheless added a wealth of knowledge to a controversial and often ill-defined research area.

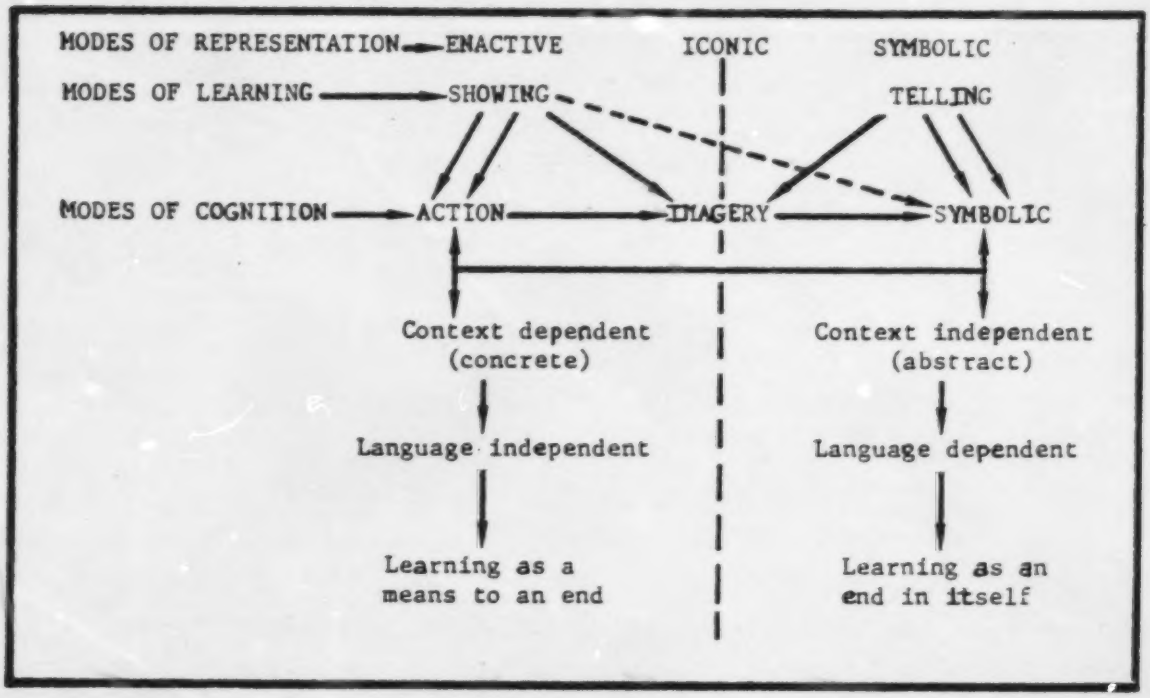
Differing from Piaget, Bruner (1964) states that any child's developmental sequence of skills transmitted by culture is organized into a series of systems for processing information in order to construct a world view. Each person goes through a series of hierarchical stages which provides the means by which individual acts are organized into more complex ensembles, so that alternative solutions to particular problems may be brought into focus. Bruner's approach to integration of perceptions called the congitive approach to child learning behavior emphasizes concept and discovery learning. For him, the major learning influences are alloplastic skills, representations molded by external factors, i.e., "man's evolution as a higher-order mammal is through experiment with objects outside his own body, rather than by conspicuous morphological changes" (Bruner, 1964), transmitted by culture via linguistic encoding.

According to Bruner (1969), humans learn to know, recognize and respond to . . . recurrent regularities in our environment by skilled and patterned acts, by conventionalized spatioqualitative imagery and selected perceptual organization, and through linguistic encoding. This is accomplished through three stages of representation. First, the enactive stage of representation is action-oriented and is pursued via direct motor responses. The second stage in this hierarchical process is the iconic form of representation, in which events are summarized by selectively organizing perceptions and images, or by organizing spatial, temporal and qualitative structures of the perceptual field and their transformed images (e.g., a photograph stands for the object photographed). Finally, in the symbolic stage, things are represented by design features that incorporate remoteness and arbitrariness. Utilization of the symbolic stage permits the user to abstract from previous representative experiences, to integrate them into the present in order to allow the individual to provide alternative solutions to problems. Bruner (1964) states:

> . . [T]he three modes of representation mentioned earlier [are the] enactive representation, iconic representation, and symbolic representation. Their appearance in the life of the

child is in that order each depending upon the previous one for its development, yet all of them remaining more or less intact throughout life . . . (p. 2)

Luhman (1975) depicts the linear progression of schooling which can be adapted to illustrate Bruner's modes of representation as the process of schooling goes from the elementary to the secondary level. The pre-elementary and early elementary years are action-oriented involving a considerable amount of showing, but becomes more and more dependent on the symbolic mode. In the secondary school the instructional mode is almost exclusively verbal.



What does this all mean in terms of education in general and bilingual education in particular? Bruner would design curricula to go from the complex to the simple, the global to the specific, with a minimum of teacher guidance. His instructors would utilize the deductive approach using the discovery or heuristic learning approach to education.

Language, says Bruner (1965), plays a powerful role as a cognitive instrument. It provides a means both for representing and transforming

experience in order to facilitate learning. It shapes, adds to, and often supercedes the information-processing capabilities the child may possess; it serves to reflect cognitive competency. One could logically assume, then, that Bruner would strive for native language maintenance. Once the child has internalized a language as a cognitive instrument, he would be taught all subject content areas in that language. For a Spanish-speaking child, Spanish would be the language of instruction, the use of English coming at a later time. Furthermore, the continued activation of those language habits already mastered would lead to improved performance.

Bruner would probably not only propose the maintenance of the child's first language, but would also accept and promote different cultures and ethnicities as viable assets in a pluralistic society. Bruner does not, as some believe, equate language and culture. He does state that language or linguistic encoding is one vital skill among many that are transmitted by culture. For him, language reflects and is the result of its influences.

The essential point to remember in assessing Bruner's (1969) learning and language theories along alloplastic lines can be best summarized by a statement in one of his early articles:

> What is significant about the growth of mind in the child is to what degree it depends not upon capacity but upon the unlocking of capacity by techniques that come from exposure to the specialized environment of a culture.

In order to develop a curriculum model that incorporates Bruner's learning theory, one must know or be able to assess the individual child's current functioning (learning) level, devise knowledge structures and procedures consistent with that student's predisposition to learn, and determine the types of experiences one wishes that child to undergo. Such an instructional model should incorporate a traditional learning environment in a contained classroom where unit and subject matter disciplines are taught. This particular model would:

(1) specify experiences/relationships with people, items and/or things which predispose the child's learning toward specific kinds of knowledge;
(2) specify the knowledge structure in each subject

matter area;

(3) specify the most effective sequences through which the learner becomes engaged with the subject matter;

(4) specify the nature and pacing of rewards and punishments.

SUMMARY

Joyce and Weil (1972) depict three learning models consistent with the thoughts of Bruner, Gagne, and Piaget.

Concept Attainment Model (Bruner)

Syntax:

Phase One

Use concept attainment games. Present information (data) for comparisons, contrasts, and hypothesizing.

Phase Two

Analyze strategies used in phase one

Phase Three

Analyze concepts from unorganized data and analyze the process.

Phase Four

Practice further concept formation and analyze the process.

Principles of Reaction: Supportive. Make sure students are clear about concept attainment strategies and other tasks.

Social System: Moderate structure with teacher controlling most of the action.

Support System: Instructor needs discrete units (data) to be used as exemplars unless students share in the making of same.

Developmental Model (Piaget)

Syntax:

Phase One	Phase Two
Student is confronted with a learning problem according to his/her stage of development and individual needs.	Student inquiries are guided by the teacher.

Principles of Reaction: The instructor creates a rich physical environment with free peer group social interacting and selects appropriate learning activities for each child.

Social System: May have tight or loose structure with the teacher acting as a guide to discovery learning.

Support System: Need well-trained instructor in the area of developmental learning theory, who is tolerant of an active classroom. Also, a material-rich environment is crucial.

Cumulative Learning Model (Gagne)
(Adaptation from the behavior model)

Syntax:

Phase One

Present Stimulus and Specify in behavioral terms the type of response desired

Phase Two

Response mission

Phase Three

Reinforcement schedule

Principles of Reaction: Directive as determined by the principles of operant conditioning and schedules of reinforcement.

Social System: Highly structured, traditional teacher-controlled environment. Little student dialogue.

Support System: Highly organized, sequences material with little room for spontaneity. Creativity described in behavioral terms.

PROBLEM AREAS WITH THE THREE MODELS

A problem area with the Concept Attainment Model has been the failure by the teacher to identify (for himself) the attributes of the concept he is trying to convey to the students. A second problem is that younger learners often do not fully comprehend the comparing and contrasting procedures involved in concept acquisition. A third problem area with the concept attainment model, which is common to all models, is the frequent incongruity between teacher and pupil concepts of the same object, person or thing. For bilingual teachers, the linguistic variable may further complicate other classroom problems if the teacher is monolingual and monocultural.

The major weakness of the Developmental Model is the difficulty encountered in assessing the student's cognitive level in order to develop the appropriate learning activities. A second weakness is that the student must be highly motivated or carefully stimulated in order to participate in discovery-type experiences. Third, linguistic and cultural variables are not adequately addressed by this model.

Instruction under the Gagnian or Cumulative Learning Model is highly structured with the teacher controlling the action. There is little if any open-ended dialogue; classroom materials are sequential and highly organized; both stimulus and response are carefully monitored. A chief weakness inherent in this behavioristic model lies in the area of immediate reinforcement. Studies have shown that delayed reinforcement is much less effective in modifying behavior than immediate reinforcement. But, in the present era of crowded classrooms and tight school budgets, how can a school teacher test more than thirty students per class section, grade and return scores in the same day, and offer more than superficial reinforcement to more than thirty different patterns of behavior? Furthermore, without knowing the nuances of specific cultural or linguistic groups, how can a teacher determine effective vs. ineffective types of learning reinforcement?

Another major weakness with behaviorally-defined curriculum models lies in the treatment of spontaneity and creativity. A concept such as creativity loses much of its mystery, glamour and spontaneity when couched in behavioristic terminology. In a bilingual classroom situation, for

instance, how does a monolingual, monocultural traditional classroom instructor evaluate levels of creativity for a young bilingual and a middle-class white child? What does any learning theory play in regard to setting up curriculum models, teacher training programs, evaluation designs, and program implementation in the area of bilingual education?

The following chart depicts the high points of each of the cited theoreticians and indicates how they correlate in bilingual education.

LEARNING THEORISTS - BILINGUAL EDUCATION
by Phillip C. Gonzales and Juan R. Juárez

	BRUNER	GAGNE	PIAGET
Major influences on learning	Alloplastic	Genetic & environment	Genetic and environment
Short definition of learning	Restructuring of representation through integration	Quantitative change in behavior	Qualitative change in thinking
Levels/Stage	Enactive Iconic Symbolic	Hierarchical	Sensory motor Preoperational Formal
Procedures in acquisition of knowledge	Heuristic discovery	Behavioristic S-R with prerequisite sequencing	Individual's own internal organization and restructuring -maturation process
Knowing	Discovering	Repetition and practice	Interaction, manipulation, transforming
Language	Internalized language facilitates learning Reflects cognitive competency	Verbalization facilitates learning	Not a prerequisite to learning but does facilitate learning Reflects cognitive development
Teaching Strategy	Concept oriented Dissonance Deductive approach Problem-solving situations Individuals acquire own learning and thinking Focused on problem	Process oriented Task analysis Inductive model Guided instruction Step-wise learning External organization necessary for optimizing learning	Consistency Opportunities for interaction with environment Inductive Rich environment No formal teaching Many manipulatives
Curricular	Global Conceptualization Concepts Ecosystems Classifications Ethnicity Immigration	Processes for acquiring knowledge -communication -observing -inferring -measuring -space-time -predicting -classification -using numbers	Logical operations -seriation -classification -causality -time and speed
Evaluation	Knowledge of concepts Process developed individually and incidentally	Concepts are incidental to learning process skills: assessment skills	Analysis of thought process to determine cognitive development

BILINGUAL IMPLICATIONS

	BRUNER	GAGNE	PIAGET
Language Instruction	Immersion Language and culture are both necessary for learning at symbolic level	Language training in restricted sense - needed for task accomplishment Communication process -task analysis is possible for language learning	Language unnecessary for learning Would not have to speak language of children just present them with a rich environment
Culture	Very important Language reflects culture and is the result of its influence	If culture teaching -then taught as a task, otherwise ignored	Important in motivating and stimulating the environment Culture - that of the classroom
Environment	Traditional	Structured and programmed	Open
Content	Unit Subject-matter disciplines	Higher order process skills -experimenting -defining operationally -hypothesizing -controlling variables -interpreting data	

CONCLUSIONS

The cognitive learning theories of Bruner and Gagne and the developmental psychology of Piaget play a central role in the development of curriculum models and instructional strategies to better serve the needs of bilingual childre- or those whose native language is not Engish. Each theory has components that may be useful to certain stages in development of a bilingual child. Depending on such factors as individual differences (Ramírez and Castañeda, 1974), degree of bilingualism, socioeconomic status, cultural heritage, and value system, as well as teacher and societal attitudes towards ethnicity and bilingual education (Peal and Lambert, 1972), elements of any theory may be utilized in the schooling process. Caution must be exercised in the utilization of any single theory for a congregation of diverse young minds for any length of time. Only careful research and classroom experimentation with methodology--instructional strategies, materials and testing mechanisms--will succeed in achieving humane results

for bilingual generations still to come.

Alvin Toffler (1974) questioned whether the purpose of educational futurism is to create elegantly complex, well-ordered, accurate images of the future, or to assist learners in their confrontations with real life crises, opportunities and challenges. Is the bilingual learner being set up in the classroom to do more than just receive or store data, or will he have an opportunity to make change or fail in the process?

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